Remove the Upper Copper End Wall of the Fundamental PAR Cavity In-situ for Inspection, Cleaning or Repair

T. Smith – 05-09-02

1) Apply "PAR MCR Over-lock" and individual lockout to both Fundamental tube amplifiers (panel TRP- J1, breakers 31,33,35 / 37,39,41).
2) Apply individual lockout to the tuner current power supply EMS 60-80 in B107, rack 14 (panel TRP- J1, breaker 38,40,42).
3) Remove the field probe connections on the lower end wall and sidewall.
4) Use a network analyzer to measure the exact resonant frequency with zero tuners current. Use S_{21} measurement to drive the cavity at the field probe loop at lower end wall and receiving with the field probe loop at the lower sidewall.

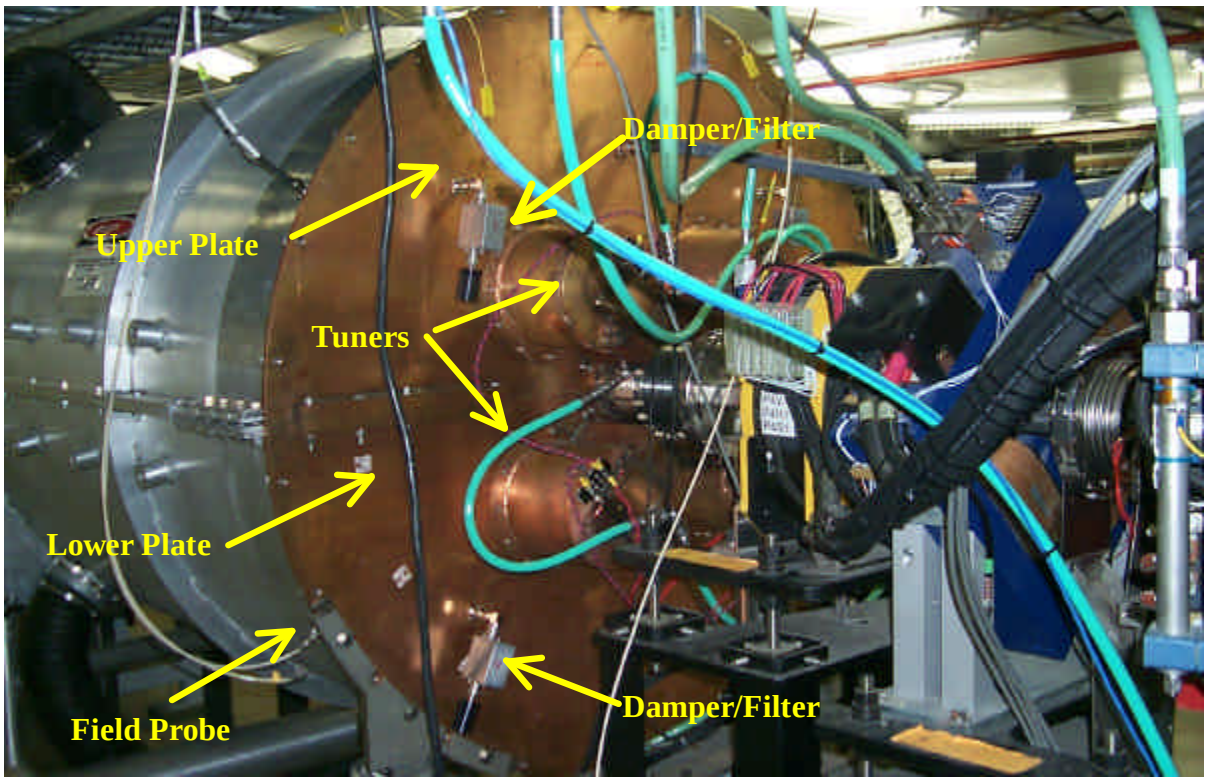

Figure 1. PAR Fundamental RF Cavity

5) Remove both upper dampers and filters.
6) Disconnect both thermocouples attached to copper end wall.
7) Remove both bottom copper end wall filters and coupler to avoid accidental damage.
8) Remove both arc detector fiber optic cables from copper end wall.
9) Bend and tie back fiber optic conduit.
10) Disconnect and move aside the "large free-standing resistor" (inside the PAR ring, in black metal housing) connected to bottom right tuner.
11) Disconnect tuner current wire connections and water connections from the top two tuners.

12) Remove the top two tuners. Each tuner weighs 90 lbs. Use the "one ton fold away mobile crane" with 2 slings (4 feet long, 1 inch wide) choked around the tuner body for support and guiding the tuner.

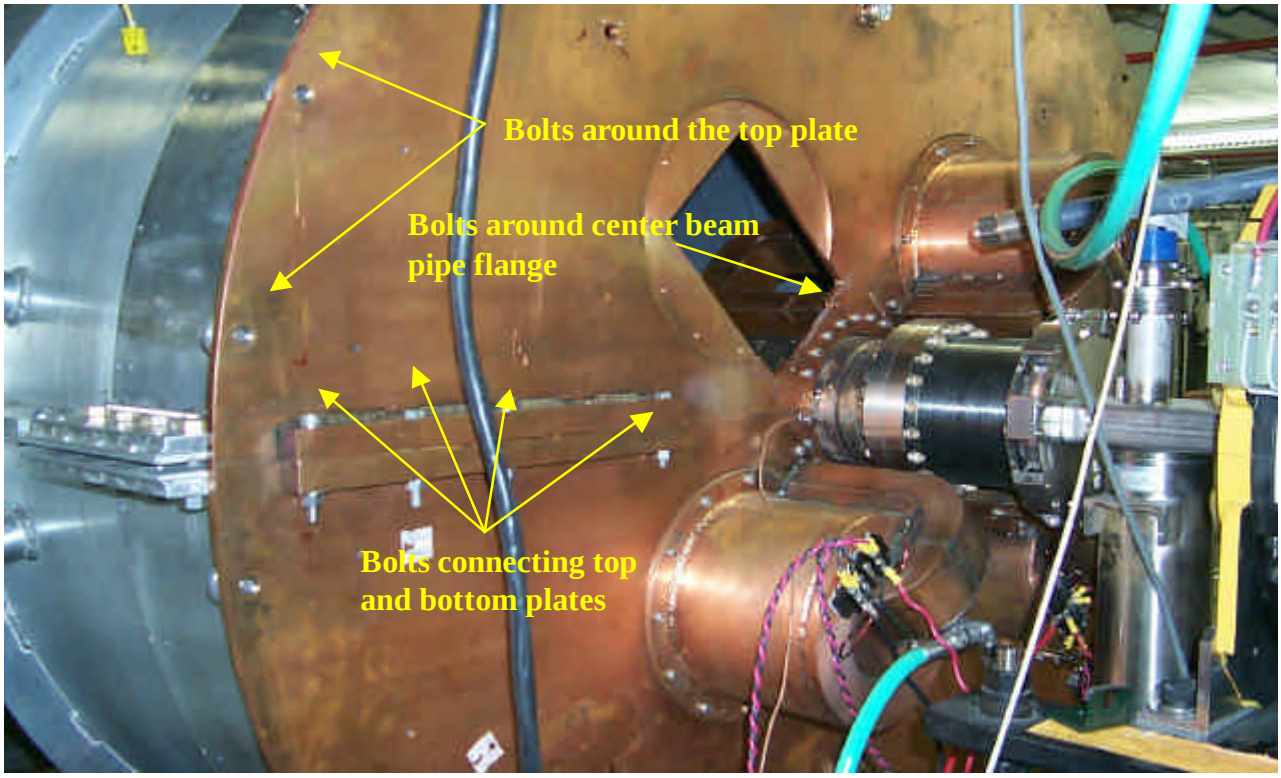

Figure 2. PAR Fundamental cavity with one tuner on the upper plate removed.

13) Remove input coupler. Disconnect 4 screws on copper end wall and one nut attached to the input coupler at the top of the cavity. Push wire in thru the top of cavity and pull input coupler out thru copper end wall.
14) Remove 12 outer bolts and all inner bolts (around center conductor) from top half of copper end wall.
15) Attach 4 eyebolts (precut to right length) to the top half of the copper end wall using the bottom 2 holes and the third hole up on each side (see photo below). With each eyebolt use one of the thick washers that were removed from the outer edge of the cavity.
16) Use shackles in the bottom 2 eyebolts and attach a 6-foot (1 inch wide) sling to both shackles and both upper eyebolts.
17) Move "one ton fold away mobile crane" into position and attach to center of sling. Crane is inside the ring and positioned where the external resistor used to be.
18) Remove all bolts that connect the top half and the bottom half of the copper end wall.

19) Gently lift and slide away top half of copper end wall, placing on floor using 4 by 4s or other supports.

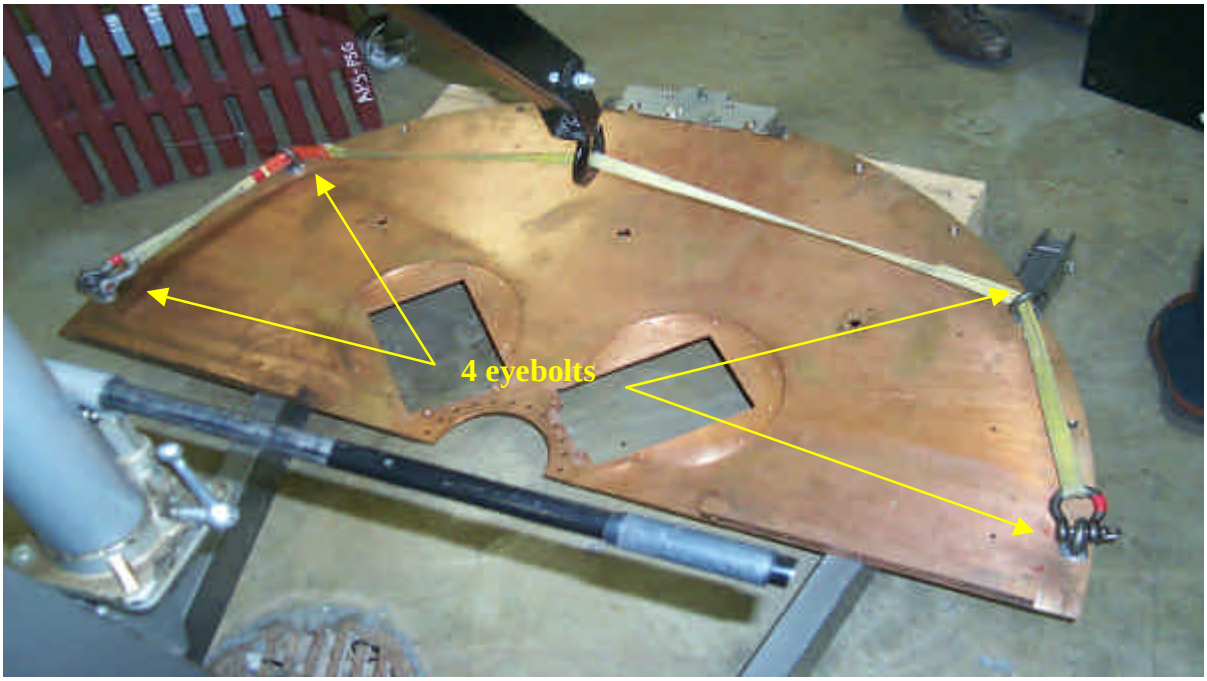

Figure 3. PAR Fundamental Cavity top plate removed.

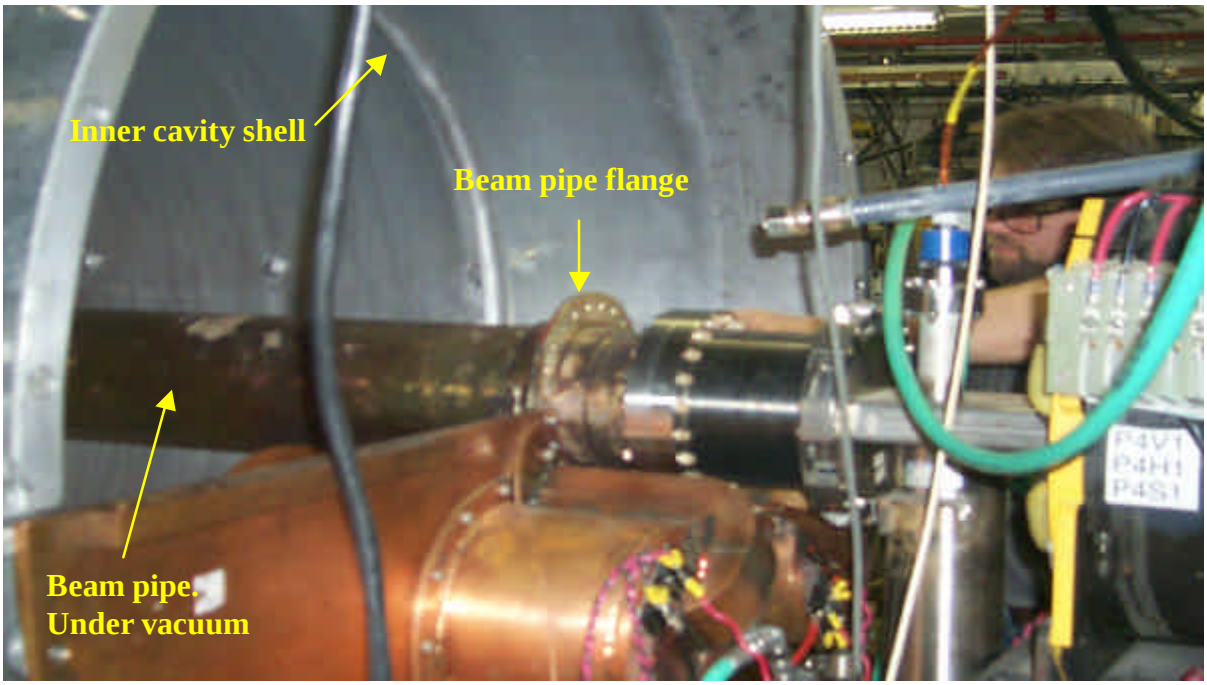

Figure 4. Looking inside the PAR Fundamental Cavity.

20) Inspect, clean or repair inside cavity.
21) During reassembly move upper copper end wall into proper position to be mounted and attach input coupler first. Reassemble in reverse order.
22) With zero tuners current, use a network analyzer to measure the resonance frequency of the cavity to make sure that it matches with the initial frequency sweep of the cavity.

NOTE: <u>All lifting pieces (4 eyebolts, 2 shackles, one 6 feet sling and two 4 feet slings) are set aside and stored in "PAR Fundamental Spares Cabinet".</u>